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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Eulmun Kim

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EXAMINER

PADGETT, MARIANNE L

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/522,369	Applicant(s) KIM ET AL.	
	Examiner MARIANNE L. PADGETT	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/25/2005 & 7/19/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/19/5</u> . | 6) <input type="checkbox"/> Other: _____ |

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1. **Claims 1-6** are rejected under 35 U.S.C. **112, second** paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Independent claim 1 preamble is not commensurate scope with the claim's body, as the claimed limitations are not to polymers, or molded goods & have absolutely nothing to do with electromagnetic radiation waves that intercept or interact in any way with any ions on the surface of any "goods".

These claims are replete with phrases that are nonidiomatic English or apparent misnomers or of ambiguous meaning, which makes their intended meaning unclear. For example in the preamble, does this phrase mean that ionized surfaces of polymers intercept (i.e. catch, block, react with, or what?) Electromagnetic radiation directed through them, and what exactly is intended by "polymer-molded", that polymers are used to molded goods, or that the goods are made out of molded polymeric material, or something else?

Similarly, in lines 4-7, the "first step" calls this multichamber structure "a vacuum unit", which means that it is a unit used to create vacuum, which would be perfectly reasonable given that it appears encompass as part of it a "vacuum pump", however in the "third step" a plasma is being generated therein & in the "second step", in line 12, the process appears to require transferring "objective products" (?somehow related to polymer-molded goods?) into the vacuum unit, neither of which make much of any procedural sense. Also it is entirely unclear how any product or article can be "objective".

In the third step, it is ambiguous whether "of an ionization gun" only applies to "arc generation" or it could also be intended to modify "filament". It is also noted that "an ionization gun" (line 14), would be a device which can be pointed or directed which causes ionization to occur, but is not necessarily an ion gun, i.e. for example an electron beam can cause ionization, thus generate ions. Further note that as there are no ion beams being employed in the plasma generation & apparatus therefore, there is nothing to have an ion beam current that needs to be controlled, especially considering that it is associated with "an

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ion generating gun" (line 16), which has no necessary relationship due to inconsistent language with the previously introduced "an ionization gun". Also in line 19 the phrasing "irradiating... cations to the... products" (emphasis added) is nonidiomatic, where the examiner notes that for only surfaces effects one would say -- irradiating... cations onto... -- & for implantation effects one would say -- irradiating... cations into... --.

With respect to the fourth step of claim 1, "the resulting ionized products" lack any antecedent basis, since merely irradiating an unspecified unknown material with ions of gases that need not react with it (He & Ar are inert gases & N while reactive with some materials is considered inert with respect to many), does not necessitate that any ionization occurs on or in the product that has been touched by ions, nor that if the surface is charged (ionized) by these ions, that it remains charged for any particular length of time, such as the length of time it takes to remove the "products" from the treatment chamber, since while static electricity may build up on a surface, it may also be very easily discharged, or if radicals are formed on the surface by breaking bonds, exposure to any non-vacuum environment, i.e. air, will generally cause immediate reaction of the radicals with reactor components of the air such as oxygen. Note that the claimed process as written encompasses having **no net effect** on the products treated. While it is not likely many people would desire to waste time & energy to no purpose, doing so is not novel.

Given the lack of clarity already present in the third step of claim 1, claim for which is directed to the control of the "ion beam current" adds more confusion, particularly as the limitation of "when an ion beam is irradiated to the objective products" is not a positive requirement that any ion beam be present & if the ion beam was present its relationship to the required generation of a plasma in the main chamber is unclear, i.e. are the plasma in the ion beam the same thing or are they 2 different things, both of which would have ions? It is noted that the application contains no figures up the apparatus employed, which might provide clarification of intent; while examples 1-3 on pages 11-13 have no plasma generation,

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strictly employing only an ion beam for surface treatment. Without clarification of the limitation in claim 1, claim for is virtually untreatable with respect to prior art.

Also in claim 4, note that "controlled in conformity to heat tolerance of the objective products" does not say how or in what way the control causes the current to 'conform' to the heat tolerances of products made of completely unspecified materials, although one might assume that anyone with any common sense will control energy supplied any process in order to ensure that no overheating due to the processing occurs, which could be an intended meaning of the phrasing.

Claim 5 as written has analogous problems as in claim 4, but makes even less sense, since the ion beam current is required in claim 1 to be that of the electric power supplied to the "ion generating gun", not to the "objective products" & a current doesn't have any "irradiation time" *per se*. Note again that the "when..." phrasing, means that no positive recitation of the limitation has been made.

Claims 6 has analogous problems to claims 4 & 5, with that further noted that what the "intensity" is for the electric power's "ion beam current" is unclear. Is this "intensity" supposed to be related to maybe the amplitude of the current, or is it not the intensity of the current at all, but of the ion beam, which has no clear use our relationship to the process of the independent claims?

Overall, the clarity of the claimed process is so poor, or the intent thereof is so obscured, that a meaningful art rejection on what is actually written is problematical.

2. The **disclosure is objected** to because of the following informalities: the disclosure appears to contain contradictory statements, in particular the first sentence on page 1 states "the present invention pertains to a method of ionizing surfaces of polymer-molded goods", with the following statement making the contradictory follow-up that "... invention relates to a method of ionizing surfaces of... goods, in which gas cations are irradiated to the... goods to improve a surface hardness of the... goods, to prevent the surfaces of the polymer-molded goods from being electrically charged,...". The phrasing which is consistent with the claim language, which implies that the resultant product has ionized

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surfaces, thus **necessarily** requires that surface to be electrically charged, since that is the meaning of being ionized, hence if the surface **is** electrically charged, it cannot prevent itself from being electrically charged! If the taught & claimed techniques is intending to use a process ionizing the surface to cause it to further react such that it no longer holds an electrical charge, that is neither what is stated nor claimed. If the process is intending to employ ion bombardment (from plasma &/or ion beam), which causes the surface to react so that it no longer holds an electrical charge, this is also neither what is stated nor claimed. The contradictory meanings found in the disclosure make it unclear exactly what applicants are intending to do with their process. Any amendments made to clarify this issue, should very clearly show their support in the original specification, and include any reasoning which is considered to be supported & necessitate such amendments.

Also note that page 7 of the specification has essentially the same unclear language as in claim 1, thus may be considered to have clarity problems analogous to those described above. It is further noted that page 10, lines 3-12 & 26-page 11, line 10, also have discussion related to plasma generation, where it could be construed that the plasma is generated in the chamber, but is also confusingly associated with an ion beam or in ion generation gun, such the specification sheds little clarifying light on the intent in the claims. Note that examples 1-3 are solely directed to ion beam treatments.

In figure 2, the caption for the x-axis appears to state "Disolacement", but to the best of the examiner's knowledge there is no such word. The brief description of figure 2 on page 8 is not consistent with the caption, nor is the discussion of figure 2 on page 12, lines 8-14 consistent with the caption.

Extensive proofreading is recommended.

Appropriate correction is required.

3. **Claims 1-6** are rejected under 35 U.S.C. **112, first** paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the

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specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As discussed above the process being performed by claims 1-6 is unclear due to unclearly related limitations & probable language problems, however the claims can be said to necessarily require that the generic substrates (objective products) be treated with a plasma that uses helium or argon or nitrogen gas, where the plasma is required to ionize those substrates, such that "ionized" products may be removed from the multiple chamber apparatus. On review of the specification (see above noted comments concerning content therein), the examiner found no disclosure that would enable the class of all objects to be ionized by the claimed plasma, such that an ionization, i.e. charge, so placed on the substrate would be maintained indefinitely, or at least until the products had been removed from the multichamber apparatus at its outlet. For these reasons, it is considered that the claims as written are not properly enabled so as to allow one of skill in the art to perform the process as claimed.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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5. **Claims 1-6** are tentatively rejected under 35 U.S.C. 103(a) as being unpatentable over **Ha et al.** (2001/0038079 A1), optionally considering **Sioshansi et al.** (5,133,757).

While the claims have too many confusing & inconsistent or unclear limitations to treat as literally written, in light of the specification one might guess by eliminating the improbable that the intent is to use a filament or arc means at generating a plasma in an ion gun configuration, so as to treat substrates, potentially polymeric molded substrates, via a so generated ion beam in order to ion implant or ion bombard the surface. (Note, ionization or ionizing, i.e. creating an electrical negative or positive charge, of the surface may occur during the ion implantation, however implanting an ion in a surface is not ionization *per se*, thus this word usage or misuse throughout the specification creates many improbable disclosures). As indicated in the paragraph bridging pages 8 & 9, the ion treatment of polymer substrates is intended to harden the surface, so as to prevent such treated surfaces from being electrically charged, i.e. to impart antistatic properties, hence it appears to the examiner that the term "ionizing" has been massively misused, such that it is probable that what it's intended by the limitations of claims 1-6, is a process that is substantially the same as that of Ha et al., who are teaching ion beam treating of polymeric surfaces, possibly using nitrogen, Ar or He gases, in improved the properties of the polymers, such that they have antistatic properties or are suitable for electromagnetic wave shields. Their ion beam is made by generating a high density plasma using apparatus as illustrated in figures 3-6, where figure 6 shows a chamber system with inlet & outlets (40, 41) & front chamber 33, irradiation chamber 34 & rear chamber 35, through which a target manipulation system (8) allows the substrates to be passed through & manipulated for complete ion beam scanning. Ha et al. particularly teach controlling parameters of the ion beam (ion beam current, ion beam energy, irradiation time, etc.) in order to control the substrate temperature of the polymer being treated & affect properties, such as the electrical resistance of the surface of the polymers, which appears to be consistent with probable intent of applicants' claims 4-6. Particularly see the abstract; the figures; [0015-30]; [0032]; [0040-41]; [0046]; [0048-54]; [0056-73]

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for description of the apparatus figures; & [0074] for an overall summation of the process. Figures 4a & 4b illustrate two different plasma ion sources, and although the written descriptions thereof in [0060-63] do not describe all the reference numbers or structure therein, the illustrated structures would appear to be consistent with arc or filament plasma generation, or alternately Sioshansi et al. (abstract; figure 2 further described in col. 5; & col. 3, lines 50-62), who teach an analogous process for (N, Ar, He, etc.) ion beam treating polymeric surfaces to cause hardening thereof, illustrate a plasma source for the ion beam which employs a filament cathode, thus demonstrating the expected effectiveness of this particular plasma generation structure for producing ion beams, such that it would've been obvious to one of ordinary skill in the art to employ such a means of plasma generation in the apparatus of Ha et al. due to the demonstrated effectiveness thereof in like processing procedures.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marianne L. Padgett whose telephone number is (571) 272-1425. The examiner can normally be reached on M-F from about 8:30 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Marianne L. Padgett/
Primary Examiner, Art Unit 1792